California Hydrogen Highway Network:

Public Presentation of Topic Team Integration Process

presented to

Ca H2 Hwy Net Public Meeting
CalEPA

October 6, 2004

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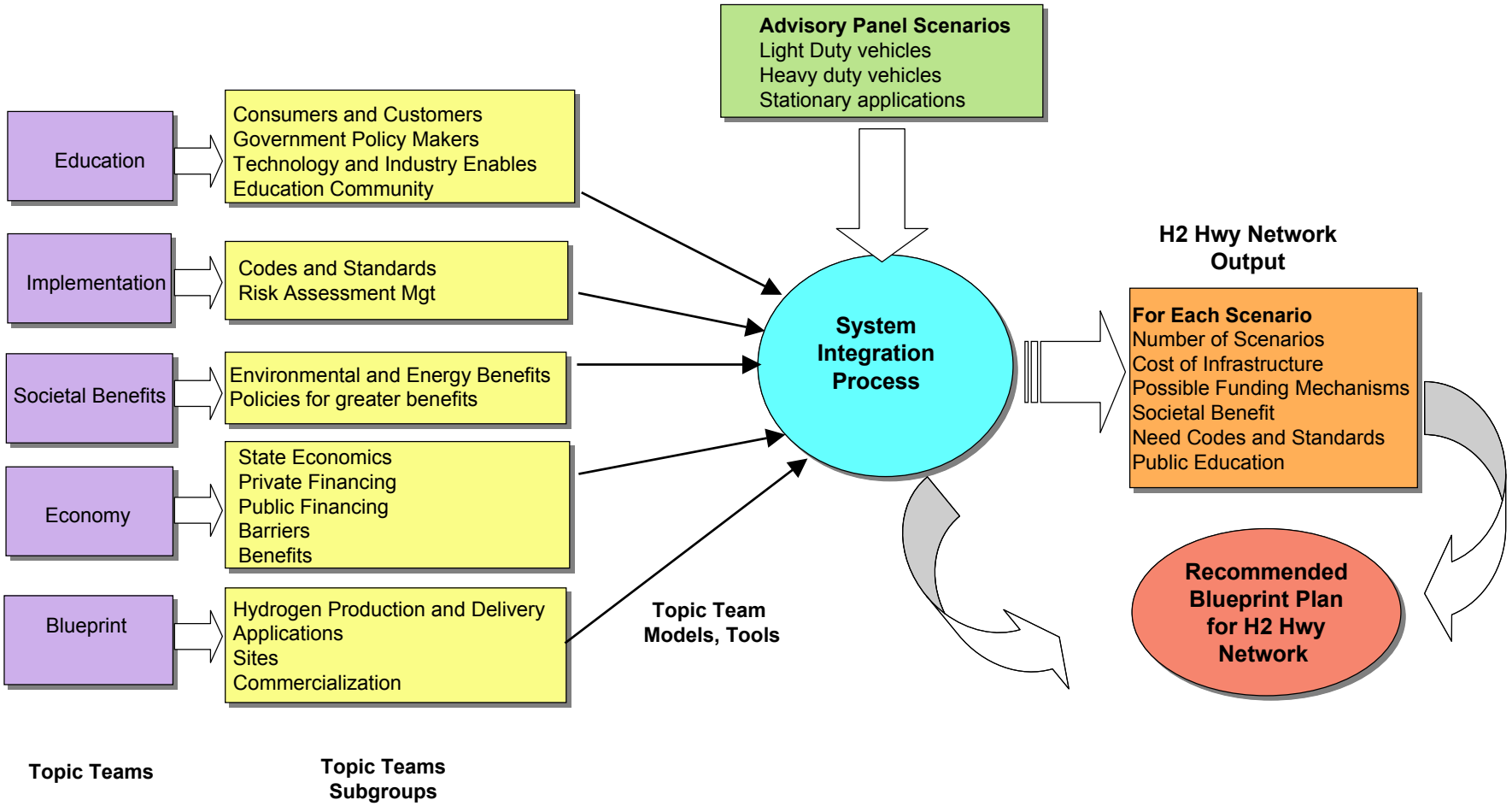
Reference: D0270

Objectives for Presentation Today

- Demonstrate how results from topic teams are being integrated into a final work product
- Describe the scenarios that drive the topic team analyses and integrated work products
- Offer opportunity for public to ask questions of the panel

Overall Approach to Blueprint Plan for 2010



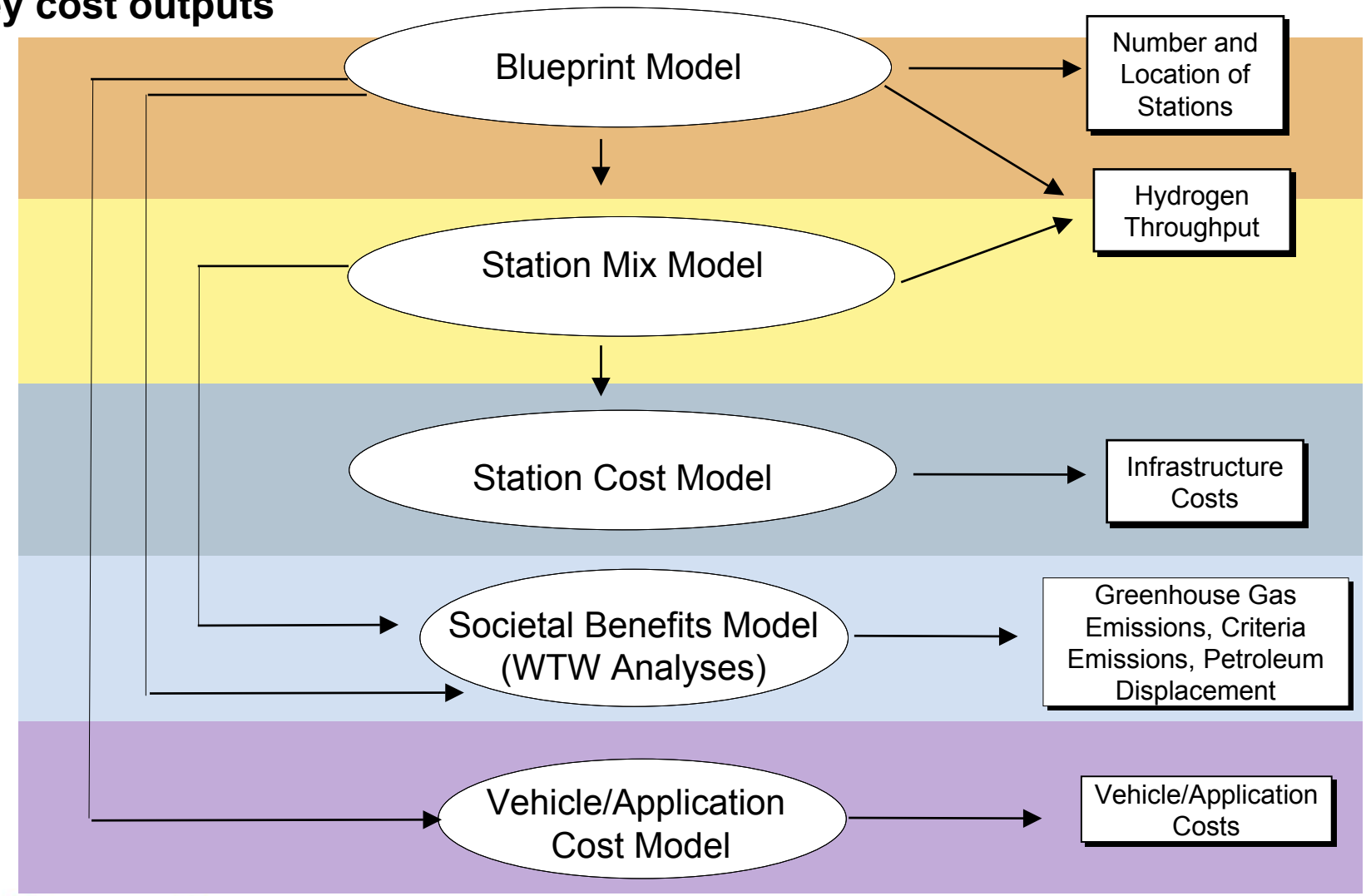
The Advisory Panel has made recommendations regarding scenarios

These scenarios provide inputs to the topic team work efforts

Vehicle and Stationary Applications	Hydrogen Vehicle and Application Scenarios		
	A	B	C
Light-Duty FCVs & ICEVs from Major Manufacturers	2,000	10,000	20,000
Heavy-Duty FCVs Other (aftermarket FCVs and ICEVs, buses using blends)	10	100	300
Stationary and off-road applications (distributed generation, building CHP, fork lifts and other off road applications)	*	*	*

*The stationary and off-road applications are still under discussion

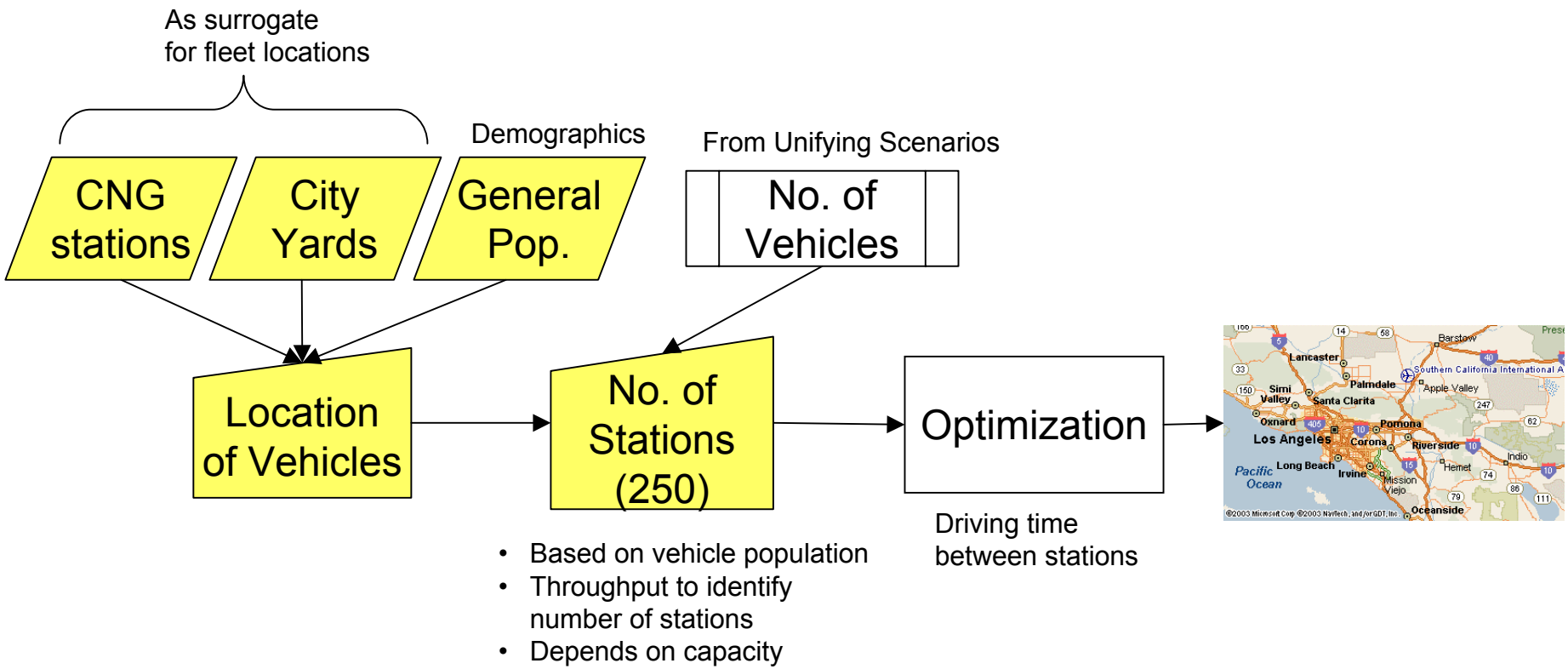
Integration of Topic Team Models/Tools – The models interact to generate key cost outputs



Blueprint Modeling estimates number of stations and hydrogen demand.

- The modeling uses the Scenarios A, B, and C for three types of hydrogen end-use devices
- Number of stations are determined based on number of LDVs and infrastructure experience from natural gas vehicles
  - To reduce drive time to stations station density is increased
  - Number of stations modified by infrastructure for HDVs and stationary applications
- Fuel consumption for these applications is estimated based on assumed end-use applications
- Blueprint topic team uses these inputs to develop hydrogen demand and approximate location of stations

Determining Number of Stations



Assumptions used for input to model

Station Mix represents many types of stations (over 60 station types have been identified)

- For analyzing societal benefits, the station mix is categorized by production strategies
  - Production strategies represents choices about fuel feedstocks, modes of distribution, and modes of hydrogen production
- For analyzing costs, the station mix is categorized by forecourt design
  - Forecourt design represents choices about equipment at the fueling station site
  - The design includes designations for sizes of stations, types of fuel, and equipment

Selection Criteria are used in developing any given station mix. These include:

- Technology diversity (type, scale, location)
- Societal benefits (GHG, renewables)
- Leveraging existing infrastructure (H_2 production, CNG stations)
- Regional connectivity
- Costs

Systems Integration Team currently is responsible for the vehicle and application cost model

- Vehicle and Application costs could include
  - R&D costs
  - Manufacturing costs
  - Marketing costs
  - Selling Costs
- These costs will depend on vehicle types – ICE, FCV, LD vs. HD – but also on how the applications will be marketed and sold
  - Fleet oriented program may have different costs than a community oriented program
  - Vehicle costs for fleet vs. community approach
  - Policy and incentives to meet scenario targets

Costs and Funding Mechanisms are integrated to Develop H2 Hwy Network Blueprint Plan